

## ABSTRACT

The present invention discloses DNA sequences encoding plant and novel lipid acyl hydrolase proteins having coleopteran specific insect inhibitory activity, as well as variants and permuteins having enhanced levels of activity directed to controlling coleotperan insect infestation and enhanced levels of expression *in planta*. Additionally, catalytic dyad active site conformation is disclosed for both dicot and monocot plant derived non-specific lipid acyl hydrolases having coleopteran insect inhibitory properties.